



STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION

DOCKET DE 17-136

IN THE MATTER OF: **2018-2020 NH STATEWIDE ENERGY EFFICIENCY
PLAN, 2019 PLAN UPDATE.**

DIRECT TESTIMONY

OF

Elizabeth R. Nixon
Utility Analyst

November 2, 2018

1 **Introduction**

2 **Q. Please state your full name?**

3 A. My name is Elizabeth R. Nixon.

4 **Q. By whom are you employed and what is your business address?**

5 A. I am employed by the New Hampshire Public Utilities Commission as a Utility Analyst. My
6 business address is 21 S. Fruit Street, Suite 10, Concord, NH 03301.

7 **Q. Please summarize your education and professional work experience.**

8 A. My educational and professional background is summarized in Attachment A.

9 **Q. What is the purpose of your testimony in this proceeding?**

10 A. My testimony provides comments and recommendations regarding the input assumptions for
11 the benefit/cost test used to evaluate the cost-effectiveness of the energy efficiency measures
12 in the New Hampshire Statewide Energy Efficiency Plan, 2019 Plan Update (“2019 Plan
13 Update”) dated September 14, 2018 filed jointly by the New Hampshire electric and gas
14 utilities (“Utilities”). The Utilities are Liberty Utilities (Granite State Electric) Corp. d/b/a
15 Liberty Utilities (“Liberty Utilities Electric”), New Hampshire Electric Cooperative, Inc.
16 (“NHEC”), Public Service Company of New Hampshire d/b/a Eversource Energy
17 (“Eversource”), Utility Energy Systems, Inc. (“UES”), EnergyNorth Natural Gas, Inc. d/b/a
18 Liberty Utilities (“Liberty Utilities Gas”), and Northern Utilities, Inc. (“Northern Utilities”).

19 **Q. Please provide a summary of your testimony.**

20 A. My testimony addresses the input assumptions to the benefit/cost test used to screen the
21 proposed energy efficiency programs, including avoided costs for transmission and
22 reliability, and environmental impacts from fossil fuels, Non-Energy Impacts (“NEIs”), and
23 Demand Reduction Induced Price Effect (“DRIPE”), and other benefits as calculated in the

1 *Avoided Energy Supply Components in New England: 2018 Report* (“2018 AESC Study”).¹
2 My testimony indicates that the assumptions that were included in the 2018-2020 New
3 Hampshire Statewide Energy Efficiency Plan (“2018-2020 EERS Plan”), as approved, should
4 be updated with the values from the 2018 AESC Study. My testimony explains that the 2019
5 Plan Update should include the avoided cost for the pooled transmission facilities (“PTF”),
6 but remove the avoided cost for transmission used in the 2018-2020 EERS plan to avoid any
7 double counting. The 2019 Plan Update should also include intrastate oil DRIPE and the
8 environmental benefits of reduced fossil fuel usage as calculated by the Utilities based on the
9 embedded environmental impacts from electric savings. The inclusion of a reliability benefit
10 in the 2019 Plan Update is premature, because additional research and review is necessary.
11 The 2019 Plan Update should not include an additional low income NEI adder; however,
12 Utilities can begin incorporating low income NEIs in the benefit/cost analysis for a customer
13 after the benefit/cost working group determines the appropriate value(s) to use. In addition,
14 Staff recommends that the performance incentive workgroup discuss how to address the
15 disincentive issue regarding low income programs.

16

17 **Background on Cost-Effectiveness Analysis**

18 **Q. What cost-effectiveness test is used by the Utilities?**

19 A. Per Order No. 22,875 in Docket No. DR 96-150, a working group was established to
20 determine the appropriate cost-effectiveness test to use to determine the benefit/cost ratio of
21 programs. The working group report, dated July 6, 1999, recommended the use of the Total
22 Resource Cost Test (“TRC”) test. As noted by the Utilities in their 2019 Plan Update (p. 36)

¹ Synapse Energy Economics et al, June 1, 2018. *Avoided Energy Supply Components in New England: 2018 Report*. Prepared for AESC 2018 Study Group. <http://www.synapse-energy.com/sites/default/files/AESC-2018-17-080-June-Release.pdf>

1 and consistent with the 1999 working group report and Order No. 22,875, the Utilities use the
2 TRC test. A few modifications to the actual costs and benefits included in the TRC test have
3 been adopted over time, but the test itself has not changed.

4 **Q. How is the cost-effectiveness test used?**

5 A. Per the 1999 working group report discussed above, a proposed program must have a
6 benefit/cost ratio of greater than 1.0 to be deemed cost-effective. The working group agreed
7 that low income programs and educational programs could still be approved even if they do
8 not exceed the 1.0 benefit/cost threshold, because the benefits are harder to quantify.²

9

10 **Cost-Effectiveness Test Assumptions**

11 **Q. What is the basis for the input assumptions for the cost-effectiveness test?**

12 A. On the cost side, the Utilities estimate the costs of the programs based on the incentives
13 provided to participants, the costs of the measures, and the administration costs of
14 implementing the programs.

15 On the benefit side, the electric and gas utilities and States in the ISO-New England region
16 hire a consultant to conduct a forecast of many of the benefits, which are summarized in a
17 study. The most recent study entitled *Avoided Energy Supply Components in New England:
18 2018 Report* (“AESC Study”) was completed on March 30, 2018 and amended in June and
19 October 2018.³ The June 1, 2018 version was used as the basis for the Utilities’ 2019 Plan
20 Update.

² Note, however, that the low income programs have typically exceeded the benefit/cost ratio of 1.0.

³ Synapse Energy Economics et al, June 1, 2018. *Avoided Energy Supply Components in New England: 2018 Report*. Prepared for AESC 2018 Study Group. <http://www.synapse-energy.com/sites/default/files/AESC-2018-17-080-June-Release.pdf>

1 **Q. Were any new or revised assumptions considered for the cost-effectiveness test for the**
2 **2019 Plan Update?**

3 A. Yes. With the 2018 AESC Study, the benefits (e.g., avoided electric energy, avoided electric
4 capacity, intrastate electric capacity demand reduction induced price effect (“DRIPE”), etc.)
5 that were used in the 2018-2020 EERS plan were revised and updated in the 2019 Plan
6 Update. In addition, the 2018 AESC Study also estimated new benefits, including an
7 estimate for intrastate oil DRIPE and avoided costs related to reliability and for pooled
8 transmission facilities (“PTF”).

9 **Q. Were any of the new assumptions from the AESC Study included in the 2019 Plan**
10 **Update?**

11 A. Yes. The Utilities included the avoided cost for PTF, reliability and intrastate oil DRIPE.
12 However, the Utilities excluded the transmission benefit that they had used previously,
13 because the two estimates may overlap and double count the transmission benefits.

14 **Q. Were any additional benefits included in the 2019 Plan Update?**

15 A. Yes. The Utilities also included an additional 10 percent NEI adder for the low income
16 programs. Also, for programs where fossil fuel usage was reduced, the Utilities included an
17 additional environmental benefit.

18 **Q. Does Staff agree with all of the assumptions that were included in the 2019 Plan**
19 **Update?**

20 A. Staff agrees with some of them, but not all of them. Staff thinks that the updates to the
21 assumptions that were included in the original 2018-2020 plan are appropriate. The inclusion
22 of intrastate oil DRIPE as a new benefit is appropriate. Staff agrees that the PTF assumption
23 for transmission should be included for this 2019 Plan Update (with the removal of the

1 transmission benefit that was used in the 2018-2020 EERS Plan), but we have concerns with
2 the methodology used for estimating the PTF benefits. We do not agree that the avoided cost
3 related to reliability should be included in the 2019 Plan Update. The additional 10 percent
4 adder for low income programs may be appropriate, but either it could wait to be
5 implemented or another approach could also address this sector.

6 **Q. What are your concerns with the assumption for avoided costs for transmission?**

7 A. In the AESC Study, the PTF benefits were calculated based solely on historical costs
8 including periods when the transmission system was incurring costs to meet projected loads
9 greater than the current load today. The methodology did not forecast any transmission costs
10 into the future. In future AESC studies, the Utilities should encourage the consultant to
11 forecast the transmission avoided cost into the future based on projected and known load
12 related needs. Staff agrees that the transmission assumption that was used in the 2018-2020
13 EERS Plan should not be included because the two estimates may overlap and double count
14 transmission benefits. In 2019 in the absence of updated data, Staff believes that it is
15 appropriate to include the PTF benefits from the AESC Study and remove the transmission
16 benefits that were used in the 2018-2020 EERS Plan.

17 **Q. Please provide more explanation related to the avoided cost assumption for reliability?**

18 According to the Utilities' response to data request OCA 2-005a, the 2019 Plan Update
19 includes a value of reliability from the 2018 AESC Study as part of the Summer Generation
20 benefit. (See Attachment B.) Note that no discussion related to this new assumption is
21 included in the 2019 Plan Update. A value of generation reliability has not been estimated as
22 part of the AESC study until this 2018 AESC Study. The AESC Study assumed that as a
23 result of load reduction, the reserve margin will increase and thereby increase reliability.

1 One of the primary factors for the value of reliability in the AESC Study is the value of lost
2 load, which was based primarily on a study conducted by Nexant, Inc. for the United States
3 Department of Energy’s Lawrence Berkeley National Laboratory⁴ (“LBNL Study”). Staff
4 has concerns with the value of reliability estimates, especially the value of lost load based on
5 this study. The LBNL Study, used as the basis for the high end of the range of value of lost
6 load, lists many limitations of the study. The most concerning limitation of the study is as
7 follows:

8 *No data were available from the northeast/mid-Atlantic region, and limited data were*
9 *available for cities along the Great Lakes. The absence of interruption cost information*
10 *for the northeast/mid-Atlantic region is particularly troublesome because of the unique*
11 *population density and economic intensity of that region. It is unknown whether, when*
12 *weather and customer compositions are controlled, the average interruption costs from*
13 *this region are different than those in other parts of the country.*

14 Another limitation of the study is the fact that about half of the data is 15 years old or more.

15 Given the limitations highlighted by this study, Staff believes that including a value of
16 reliability benefit in the 2019 Plan Update is premature. Staff believes that there may be
17 some reliability benefits, but much more research and review must be undertaken before New
18 Hampshire can include such a benefit. To further the review, the Utilities should work with
19 the AESC Study consultant to provide more New Hampshire-specific data for consideration.

20 **Q. Please provide more explanation related to the additional 10 percent adder for low**
21 **income programs.**

⁴ Nexant, Inc., January 2015, *Updated Value of Service Reliability Estimates for Electric Utility Customers in the United States*. Prepared for the United States Department of Energy, Lawrence Berkeley National Laboratory. <https://emp.lbl.gov/sites/default/files/lbnl-6941e.pdf>

1 A. Per Order No. 26,095 for the 2018-2020 EERS Plan, the Commission approved the
2 Settlement Agreement which included a 10 percent adder for NEIs for all programs,
3 established the benefit/cost workgroup to determine if a separate NEI adder for the low
4 income program is appropriate (among other things), and required the EM&V workgroup to
5 work with the benefit/cost workgroup to initiate studies regarding NEIs to obtain New
6 Hampshire-specific, evidence-based NEIs. The Utilities have hired a consultant to conduct a
7 cross-cutting NEI study to establish New Hampshire-specific NEIs, and another consultant to
8 determine low income-specific NEIs. Staff believes that the 10 percent adder for all
9 programs was included as a placeholder until New Hampshire-specific, evidence-based NEIs
10 could be established. In the 2019 Plan Update, the Utilities have proposed to include an
11 additional 10 percent adder for low income programs. As noted above, the low income
12 programs are given more flexibility regarding the benefit/cost ratio. However, the Utilities
13 have indicated that in many situations, if a low income job has a benefit/cost ratio less than
14 1.0, they will not proceed with the job. This type of job typically includes pre-weatherization
15 issues that are not directly related to the traditional energy savings measures, such as “roof
16 leaks, lack of proper ventilation, rodent infestations, live knob and tube wiring or open
17 wiring junction boxes.” (See Data Response Staff 2-042 in Attachment C.) In these
18 situations, the Utilities defer these projects until the customer can address these issues on
19 their own. Even though the Utilities have flexibility with the benefit/cost ratio, the
20 performance incentive provides a disincentive for the Utilities to go below 1.0 since the low
21 income programs are a significant part of the residential program budgets (36% of the 2019
22 residential electric budget and 33% of the 2019 residential gas budget). Staff recognizes that
23 low income programs do have NEIs, but until the study is complete in Spring 2019, Staff

1 does not know the New Hampshire-specific, evidence-based value. At the same time, Staff
2 recognizes that the performance incentive provides a disincentive for the utilities to proceed
3 with projects that are below the benefit/cost ratio of 1.0. To encourage more low income
4 energy efficiency measures, either the appropriate level of NEIs could be included as benefits
5 or alternatively, or in addition, the performance incentive could be changed to exclude low
6 income programs in the calculation. For 2019, Staff recommends that the 2019 Plan Update
7 not include an additional low income NEI adder; however, Utilities can begin incorporating
8 low income NEIs in the benefit/cost analysis for a customer after the benefit/cost working
9 group determines the appropriate value(s) to use. In addition, Staff recommends that the
10 performance incentive workgroup discuss how to address the disincentive issue regarding
11 low income programs.

12 **Q. Please provide more explanation related to the environmental benefit related to fossil**
13 **fuels.**

14 A. In Order No. 23,574 in Docket DR 96-150, the Commission approved an adder of 15 percent
15 for environmental and other benefits of the electric energy efficiency programs until such
16 time that the environmental markets are more established while also ensuring that these
17 benefits are not already embedded in the avoided cost of generation. In the Settlement
18 Agreement in DG 02-106 which was approved by Order No. 24,109, the Parties agreed to use
19 the 15 percent adder for the gas energy efficiency program. In the 2008 Core plans, the
20 electric and gas utilities excluded the 15 percent adder. No other reference was made to the
21 discontinuance other than in the 2008 Core energy efficiency plan:

22 *The use of the 15% adder to represent environmental and other benefits as*
23 *recommended by the Energy Efficiency Working Group, originally authorized by the*

1 *NHPUC in DR 96-150, Order No. 23574, dated November 1, 2000, was discontinued*
2 *because the 2007 AESC avoided costs included market-based price proxies for power*
3 *plant emissions of NO_x, SO₂, Mercury and CO₂.*⁵

4 This explanation presented in the 2008 plan filing explains why the adder was removed from
5 the electric energy efficiency programs, but does not explain why it was removed from the
6 gas energy efficiency programs or other programs with fossil fuel savings. In the 2019 Plan
7 Update, the Utilities have proposed to include a benefit for fossil fuel savings based on the
8 embedded environmental benefits associated with electric savings, specifically the Regional
9 Greenhouse Gas Initiative (“RGGI”) forecasts estimated in the 2018 AESC Study and the
10 amount of carbon dioxide (“CO₂”) in each type of fossil fuel. For example, for 1 MMBtu of
11 oil savings, the environmental benefit is calculated by multiplying 161.3 pounds
12 CO₂/MMBtu by \$8.98/ton CO₂ RGGI price (in \$2019) by 1 ton/2000 pounds and is equal to
13 \$0.724/MMBtu of oil saved. (See Attachment D for an explanation of this calculation in the
14 response to data request No. Staff 2-044.) Staff supports the inclusion of the environmental
15 benefit for fossil fuel savings to provide symmetry to the electric programs which have the
16 environmental benefit already embedded in the electric avoided costs and since no
17 justification can be found for previously discontinuing it.

18 **Q. Do you have any other comments related to the cost-effectiveness test and associated**
19 **assumptions?**

20 A. Yes. In the 2019 Plan Update that the Utilities submitted on September 14, 2018, a few
21 errors were discovered by the Utilities and Staff in the benefit/cost model and the text in the

⁵ Utilities, September 28, 2007 (revised February 29, 2008), *2008 CORE New Hampshire Energy Efficiency Programs*, Attachment C, p. 60.
<http://puc.nh.gov/Electric/NH%20EnergyEfficiencyPrograms/2008%20CORE%20NH%20Energy%20Efficiency%20Program%20Filing%20%20Revised%2029Feb2008%20%20FINAL.pdf>

1 2019 Plan Update related to the benefit/cost test and assumptions. Staff and the Utilities are
2 working to resolve these errors, and the Utilities have indicated to Staff their willingness to
3 correct these errors in an updated filing in this docket.

4 In the future, to assist Staff and others in reviewing the plan and recognizing any changes
5 that have been made regarding the cost-effectiveness test and associated assumptions, a
6 listing in Attachment A, Summary of Changes as well as a detailed explanation and summary
7 table of the assumption values (and a note of any changes) should be included either in the
8 plan or as an attachment. For any new assumptions, the formulas used to calculate such
9 assumptions would be helpful.

10 **Q. Do you have any other recommendations regarding the 2019 Plan Update and future**
11 **plans and updates?**

12 A. Yes. As part of the plans and updates, Staff recommends that the Utilities include a summary
13 of all of the incentives/rebates for each measure and indicate any changes that will be made
14 from the previous plan and if any incentives/rebates will change during the plan year. This
15 information not only provides a greater understanding of the available incentives/rebates for
16 each measure for a customer's consideration, but also provides further detail regarding the
17 fundamental costs of the energy efficiency plans.

18 **Q. Does this conclude your testimony?**

19 A. Yes.

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